FSD160N06A

**TO-252　N Channel Enhancement 沟道增强型**
**MOS Field Effect Transistor 场效应管**

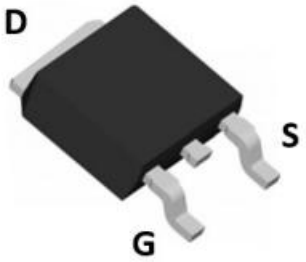
## ■Features 特点

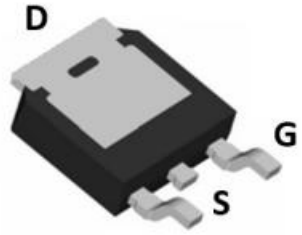
Low on-resistance 低导通电阻
$R_{DS(ON)}$=2mΩ(Type)@$V_{GS}$=10V
$R_{DS(ON)}$=2.6mΩ(Type)@$V_{GS}$=4.5V

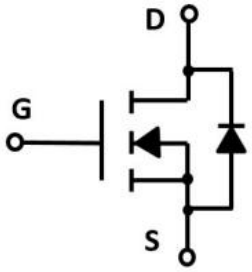
## ■Applications 应用

Backlight Drive 背光驱动
DC-DC Conversion 升压转换
Power Management 电源管理

## ■Internal Schematic Diagram 内部结构




## ■Absolute Maximum Ratings 最大额定值

| Characteristic 特性参数 | Symbol 符号 | Rat 额定值 | Unit 单位 |
|---|---|---|---|
| Drain-Source Voltage 漏极-源极电压 | $BV_{DSS}$ | 60 | V |
| Gate- Source Voltage 栅极-源极电压 | $V_{GS}$ | ±20 | V |
| Drain Current (continuous)漏极电流-连续 | $I_D$（at $T_C$ = 25°C） | 160 | A |
| Drain Current (pulsed)漏极电流-脉冲 | $I_{DM}$ | 480 | A |
| Total Device Dissipation 总耗散功率 | $P_{TOT}$(at $T_C$ = 25°C) | 320 | W |
| Thermal Resistance Junction-Case/Ambient 热阻 | $R_{\Theta JC}$<br>$R_{\Theta JA}$ | 0.39<br>62.5 | ℃/W |
| Avalanche Energy Single Pulse 雪崩能量 | $E_{AS}$ | 270 | mJ |
| Junction/Storage Temperature 结温/储存温度 | $T_J$,$T_{stg}$ | 150℃,-55~150℃ | |

## ■Electrical Characteristics 电特性

($T_A$=25℃ unless otherwise noted 如无特殊说明，温度为 25℃)

| Characteristic<br>特性参数 | Symbol<br>符号 | Min<br>最小值 | Typ<br>典型值 | Max<br>最大值 | Unit<br>单位 |
|---|---|---|---|---|---|
| Drain-Source Breakdown Voltage<br>漏极-源极击穿电压($I_D$ =250uA,$V_{GS}$=0V) | $BV_{DSS}$ | 60 | — | — | V |
| Gate Threshold Voltage<br>栅极开启电压($I_D$ =250uA,$V_{GS}$= $V_{DS}$) | $V_{GS(th)}$ | 1.1 | 1.5 | 2.1 | V |
| Zero Gate Voltage Drain Current<br>零栅压漏极电流($V_{GS}$=0V, $V_{DS}$= 60V) | $I_{DSS}$ | — | — | 1 | uA |
| Gate Body Leakage<br>栅极漏电流($V_{GS}$=±20V, $V_{DS}$=0V) | $I_{GSS}$ | — | — | ±100 | nA |
| Static Drain-Source On-State Resistance<br>静态漏源导通电阻($I_D$=30A,$V_{GS}$=10V)<br>($I_D$=20A,$V_{GS}$=4.5V) | $R_{DS(ON)}$ | — | 2<br>2.6 | 2.6<br>3.4 | mΩ |
| Diode Forward Voltage Drop<br>内附二极管正向压降($I_{SD}$=30A,$V_{GS}$=0V) | $V_{SD}$ | — | — | 1.4 | V |
| Input Capacitance 输入电容<br>($V_{GS}$=0V, $V_{DS}$=25V,f=1MHz) | $C_{ISS}$ | — | 5460 | — | pF |
| Common Source Output Capacitance<br>共源输出电容($V_{GS}$=0V, $V_{DS}$=25V,f=1MHz) | $C_{OSS}$ | — | 1290 | — | pF |
| Reverse Transfer Capacitance<br>反馈电容($V_{GS}$=0V, $V_{DS}$=25V,f=1MHz) | $C_{RSS}$ | — | 13 | — | pF |
| Total Gate Charge 栅极电荷密度<br>($V_{DS}$=30V, $I_D$=10A, $V_{GS}$=10V) | $Q_g$ | — | 86 | — | nC |
| Gate Source Charge 栅源电荷密度<br>($V_{DS}$=30V, $I_D$=10A, $V_{GS}$=10V) | $Q_{gs}$ | — | 14 | — | nC |
| Gate Drain Charge 栅漏电荷密度<br>($V_{DS}$=30V, $I_D$=10A, $V_{GS}$=10V) | $Q_{gd}$ | — | 14 | — | nC |
| Turn-ON Delay Time 开启延迟时间<br>($V_{DS}$=30V $I_D$=60A, $R_{GEN}$=4.7Ω,$V_{GS}$=10V) | $t_{d(on)}$ | — | 20 | — | ns |
| Turn-ON Rise Time 开启上升时间<br>($V_{DS}$=30V $I_D$=60A, $R_{GEN}$=4.7Ω,$V_{GS}$=10V) | $t_r$ | — | 127 | — | ns |
| Turn-OFF Delay Time 关断延迟时间<br>($V_{DS}$=30V $I_D$=60A, $R_{GEN}$=4.7Ω,$V_{GS}$=10V) | $t_{d(off)}$ | — | 95 | — | ns |
| Turn-OFF Fall Time 关断下降时间<br>($V_{DS}$=30V $I_D$=60A, $R_{GEN}$=4.7Ω,$V_{GS}$=10V) | $t_f$ | — | 25 | — | ns |

## ■Typical Characteristic Curve 典型特性曲线

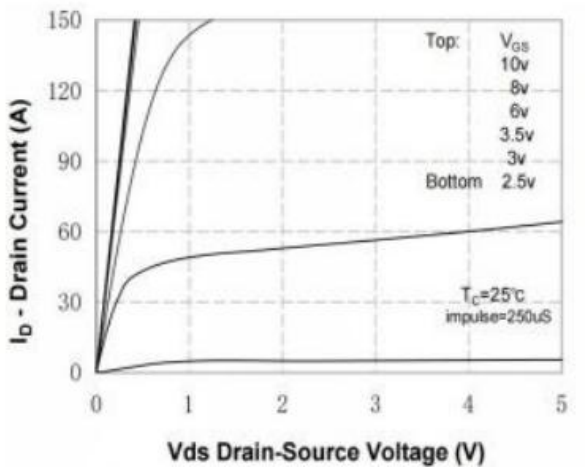



Figure 1: Output Characteristics

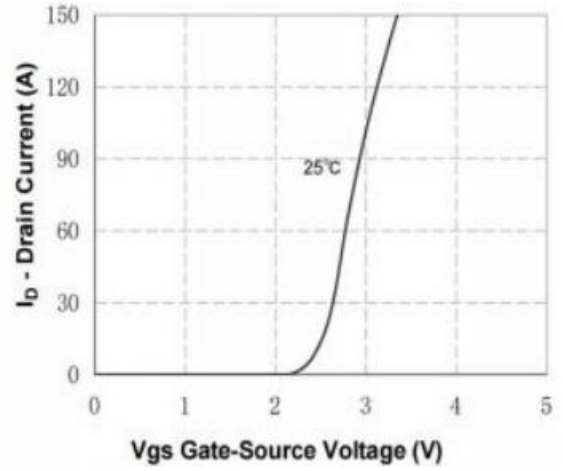



Figure 2: Transfer Characteristics

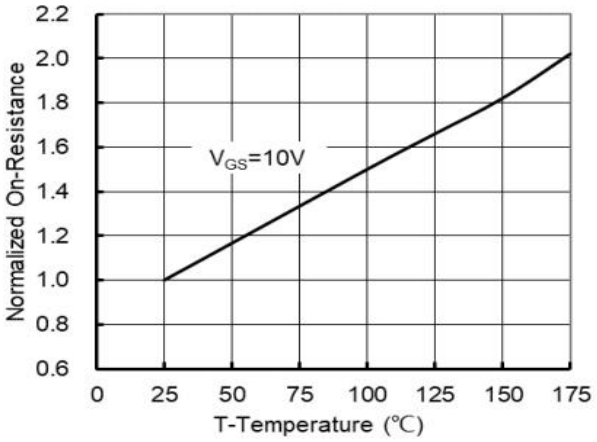



Figure 3: On-Resistance vs. $T_J$

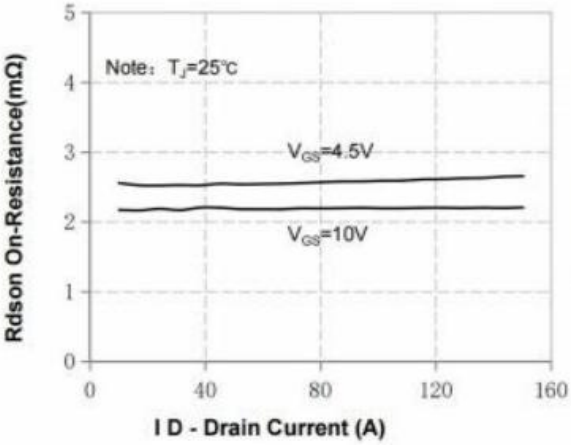



Figure 4: On-Resistance vs. Drain Current

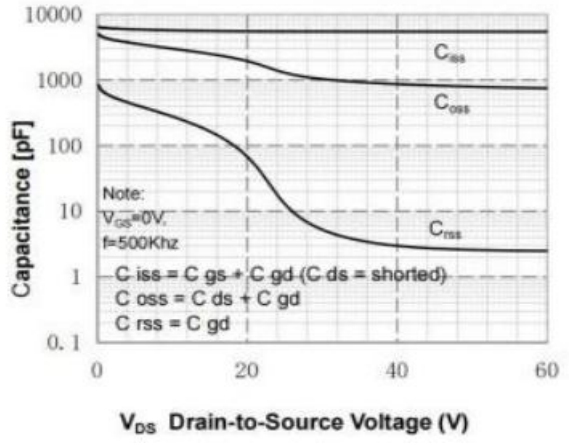



Figure 5: Capacitance Characteristics

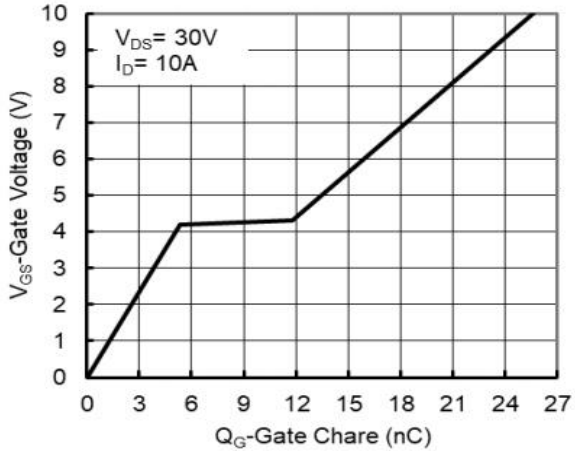



Figure 6: Gate-Charge Characteristics

## ■Typical Characteristic Curve 典型特性曲线

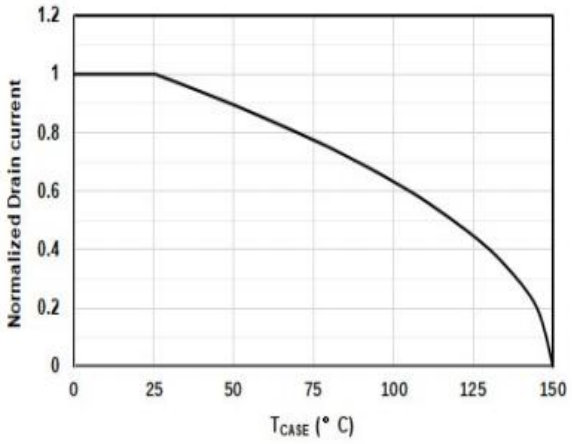



Figure 7: Drain Current Characteristics

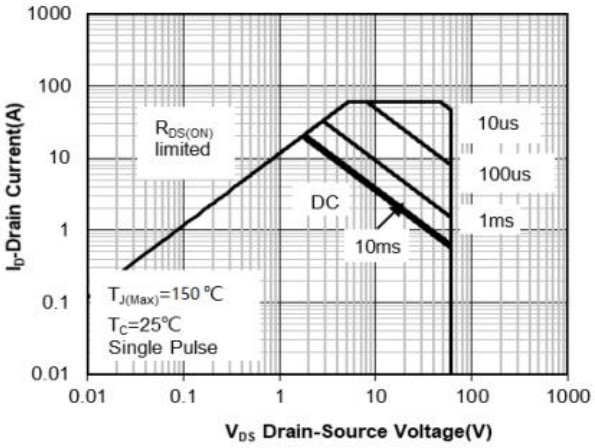



Figure 8: Safe Operating Area

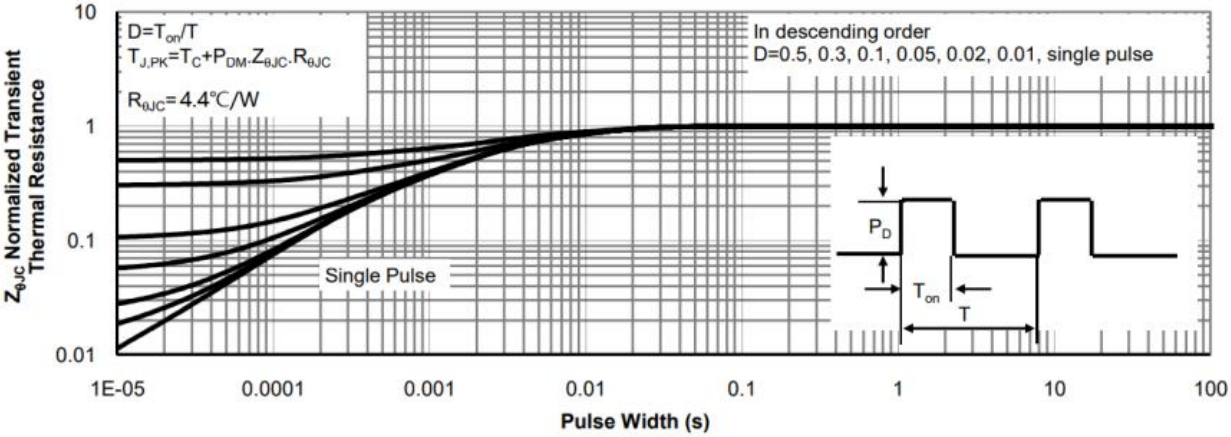
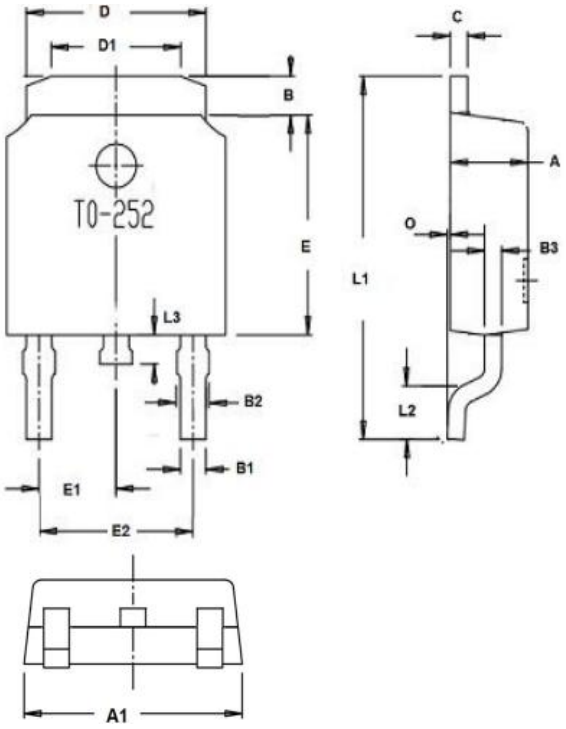



Figure 9: Transient Thermal Response Curve

## ■ Dimension 外形封装尺寸




| Dim. | Min. | Max. |
|---|---|---|
| A | 2.1 | 2.5 |
| A1 | 6.3 | 6.9 |
| B | 0.95 | 1.55 |
| B1 | 0.6 | 0.8 |
| B2 | 0.75 | 0.95 |
| C | Typ0.5 | |
| D | 5.3 | 5.5 |
| D1 | 3.65 | 4.05 |
| E | 5.8 | 6.4 |
| E1 | Typ2.3 | |
| E2 | Typ4.6 | |
| O | 0 | 0.15 |
| L1 | 9 | 11 |
| L2 | Typ1.5 | |
| L3 | 0.7 | 1 |
| All Dimensions in millimeter | | |